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A43B 21/26

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A3B B2A

(56) Documents cited
GB 0591740 A FR 002112848 A FR 002105684 A
US 4881329 A US 4771554 A US 4592153 A

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UK CL (Edition K) A3B
INT CL[5] A43B

(54) Heel for footwear

(57) A sprung heel for a shoe, for example an orthopaedic shoe or a running shoe, has a U-shaped blade 12, 14 of eg carbon fibre material and a skirt 20–28 which prevents dirt and debris from collecting within the heel whilst still permitting the blade to flex. In an alternative form the space between the arms of the U is filled with a block of pliable material.

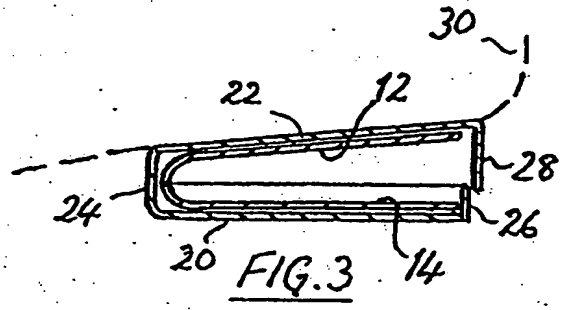

FIG.3

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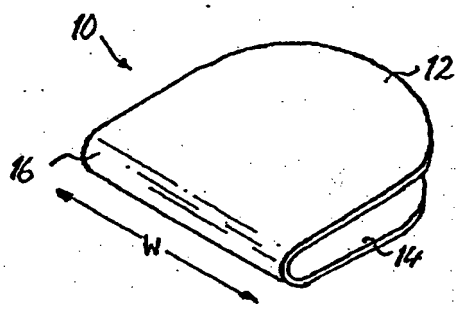

FIG.1

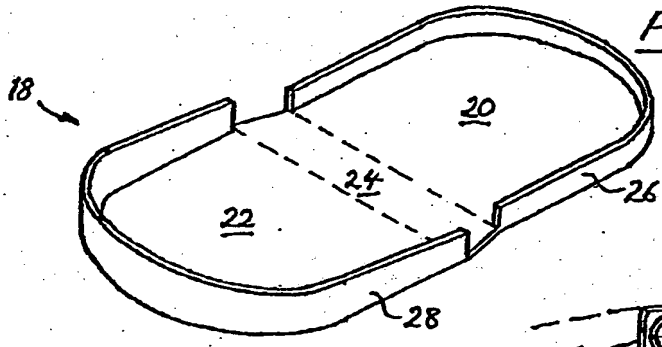

FIG.2

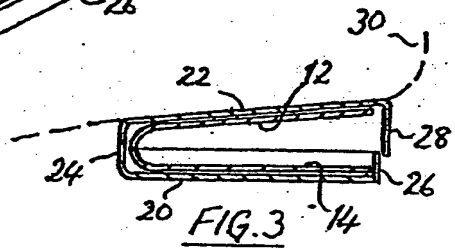

FIG.3

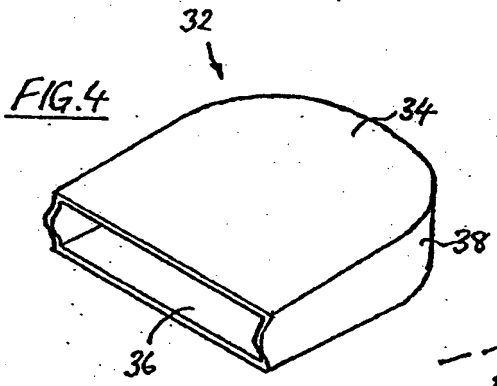

FIG.4

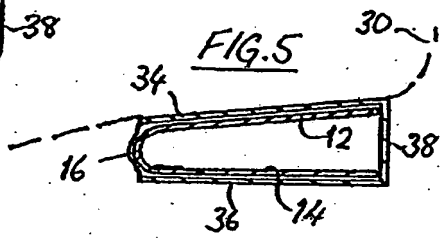

FIG.5

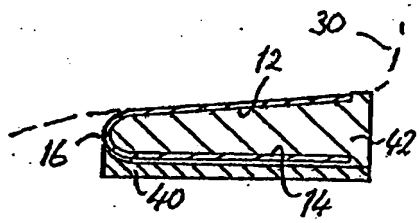

FIG 6

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HEEL FOR ARTICLE OF FOOTWEAR

This invention relates to a heel for, or of, an article of footwear.

More particularly, this invention is concerned with a heel which is springy so as to reduce the physical shock to the wearer's ankle, leg, knee, hip and/or spine during walking and also to produce an effect which, when incorporated in a running shoe, will throw the runner forward slightly with each step and thus increase the runner's speed.

Various sprung heels have been proposed in the past which incorporate a bent resilient blade, for example see patent specifications US 2447603, US 1625048, US 4592153, GB 569169 and GB 660774. However, none of these earlier heels appears to have met with any substantial commercial success, and it is thought that this may be due to: the weight of the heels; the probability that dirt and debris will become trapped in the blade; cleaning of the heel being more difficult than with a conventional heel; and/or the heel is lacking in aesthetic qualities.

In accordance with a first aspect of the present invention, a heel for, or of, an article of footwear comprises a U-shaped blade of resilient material, the free ends of which point to the rear of the heel and an upper limb of which is secured to, or is adapted to be secured to, the article of footwear. A skirt is provided which at least partly surrounds the blade but permits the limbs of the blade to flex in use. By providing such a skirt, the heel is less likely to trap debris and will be easier to clean, and furthermore it will appear more like a conventional heel.

In one embodiment of the invention the skirt comprises first and second skirt portions which are mounted with respect to the upper and lower limbs, respectively, of the blade, and the skirt portions are arranged to telescope with each other as the blade flexes in use. In another embodiment of the invention, the skirt is secured to the upper and lower limbs of the blade and is flexible so that it can buckle as the upper and lower limbs are flexed towards each other. In yet another embodiment, the skirt is provided by the periphery of a block of spongy or pliable material with which the blade is moulded.

In accordance with a second aspect of the present invention, a blade of the above-mentioned type is formed of a carbon fibre material (such as "Kevlar", registered trade mark) so as to provide a blade of great strength but low weight. The carbon fibre blade may be used with the skirt, as described above.

In the heel according to the first or second aspect of the invention, the upper and lower limbs of the blade may be generally parallel in the relaxed state, but preferably, especially in the case of a heel for an athlete's shoe, the limbs diverge slightly when in a relaxed state and may even diverge slightly (to a lesser extent) when normal weight is applied to the heel. Furthermore, the portion of the blade between the upper and lower limbs in preferably smoothly curved without any sharp bends or other stress concentrating features.

Although the invention may be employed in a general purpose shoe, it has a particular therapeutic effect when applied to an orthopaedic shoe for people suffering especially from spinal complaints, and a particular speed increasing effect when applied to an athlete's shoe.

Specific embodiments of the present invention will now described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a blade for a heel;

Figure 2 is a perspective view of one form of moulding used to form the skirt of a heel;

Figure 3 is a longitudinal sectional view through a heel incorporating the skirt of Figure 2;

Figure 4 is a perspective view of a different form of moulding which may be used to form a skirt of a heel;

Figure 5 is a longitudinal sectional view through the heel of a shoe incorporating the skirt of Figure 4; and

Figure 6 is a longitudinal sectional view through a further form of heel.

Referring to Figure 1, a blade 10 is formed of any suitable material, but preferably, especially in the case of a running shoe, is formed of Kevlar. The blade 10 is U-shaped with an upper limb 12, a lower limb 14 and a gently curved portion 16 joining the two. In the relaxed state, the limbs diverge from each other, for example at an angle of 5^0 to 10^0. The width W of the limbs 12, 14 and the curved

portion 16 is approximately equal to or slightly less than the width of the carcass of the shoe to which the heel is to be attached. The radius of the curved portion 16 may be, for example, 3 to 5mm. The thickness of the blade 10 at the curved portion 16 is chosen so that the upper and lower limbs 12, 14 can flex towards each other during walking and running but so that the free ends of the limbs 12, 14 will touch only if the wearer comes down very hard on their heel. Preferably, when standing normally on the heel, the upper and lower limbs will still diverge from each other.

Referring to Figures 2 and 3, a skirt moulding 18 of, for example, synthetic rubber has a first flat portion 20 of the same size and shape as the lower limb 14 of the blade, a second flat portion 22 of the same shape as, but slightly larger than the size of, the upper limb 12 of the blade, and a joining portion 24 between the two flat portions 20, 22. Each of the flat portions 20, 22 has a peripheral wall 26, 28 extending around its edge, except in the region of the joining portion 24. As shown in Figure 3, the flat portion 20 is bonded to the lower limb 14 of the blade, and the flat portion 22 is bonded to the upper limb 12 of the blade, with the joining portion 24 covering the curved portion 16 of the blade. Because the flat portion 22 is slightly larger than the flat portion 20, the wall 28 lies outside the wall 26. Furthermore, the heights of the walls 26, 28 are chosen such that, when the blade 10 is in a relaxed state, the walls 26, 28 overlap slightly, thus forming a telescoping arrangement. The blade 10 is therefore permitted to flex. As shown in Figures 2 and 3, the wall is higher at its centre than at its ends to take account of the divergence of the blade. Alternatively, the other wall 26, or both walls may have this feature. Also, the wall 28 may be of constant height so that the walls do not overlap when the blade is relaxed, but so that the walls come closer together or overlap when the wearer is standing normally on the heel. Part of the carcass of the shoe is shown in Figure 3 by reference numeral 30, and the heel is secured to the carcass 30 by bonding, rivets and/or any other suitable means.

Figures 4 and 5 show an alternative skirt moulding 32, which is in the form of a box of, for example, synthetic rubber, which is open at the front. The moulding 32 has upper and lower walls 34, 36 which are generally of the same size and shape as the upper and lower limbs

12, 14 of the blade, and a side wall 38 which extends along the sides of and round the back of the moulding. As shown in Figure 5, the blade 10 is fitted into the skirt moulding 32 and bonded thereto, and then the upper wall 34 of the skirt moulding is secured in any suitable manner to the carcass 30 of the shoe. The side wall 38 of the skirt moulding 32 is of such a thickness that it can easily buckle to permit the blade 10 to flex. The skirt moulding 32 may be a single moulding, or alternatively it may be formed in two parts, for example the upper wall 34 and side wall 38 being of one material which is particularly flexible, and the lower wall 36 being of a hard-wearing material.

Referring to Figure 6, a further embodiment of the invention is shown in which the blade 10 of Figure 1 is directly secured to the carcass 30 of the shoe and a heel piece 40 of hard-wearing rubber is bonded beneath the lower limb 14 of the blade. The space between the limbs 12, 14 of the blade is filled by moulding with a spongy or very pliable block 42 of material which will permit the upper and lower limbs 12, 14 of the blade to flex towards each other, but which fills the space between the limbs so as to prevent debris and dirt collecting between the limbs 12, 14.

While a number of embodiments of the invention have been described in detail above, merely by way of example, it will be appreciated that many modifications and developments may be made to the invention.

CLAIMS

1. A heel for, or of, an article of footwear, comprising a U-shaped blade of resilient material, the free ends of the blade pointing to the rear of the heel and an upper limb of the blade being secured to, or being adapted to be secured to, the article of footwear, and a skirt which at least partly surrounds the blade but permits the limbs of the blade to flex in use.

2. A heel as claimed in claim 1, wherein the skirt comprises a first skirt portion mounted with respect to the upper limb of the blade and a second skirt portion mounted with respect to the lower limb of the blade, the skirt portions being arranged to telescope with respect to each other as the blade flexes.

3. A heel as claimed in claim 1, wherein the skirt is secured to the upper and lower limbs of the blade and is flexible so that the skirt can buckle as the upper and lower limbs are flexed towards each other.

4. A heel as claimed in claim 1, wherein the skirt is provided by the periphery of a block of spongy or pliable material with which the blade is moulded.

5. A heel as claimed in any preceding claim, wherein the blade is formed from a carbon fibre material.

6. A heel for, or of, an article of footwear, comprising a U-shaped blade of resilient material, the free ends of the blade pointing to the rear of the heel and the upper limb of the blade being secured or being adapted to be secured to the article of footwear, the blade being formed of a carbon fibre material.

7. A heel as claimed in any preceding claim, wherein the upper and lower limbs of the blade are generally parallel.

8. A heel as claimed in any of claims 1 to 6, wherein the upper and lower limbs diverge slightly when the blade is relaxed.

9. A heel as claimed in any preceding claim, wherein the blade is gently curved between the upper and lower limbs.

10. A heel substantially as described with reference to the drawings.

11. An article of footwear having a heel as claimed in any preceding claim.

Patents Act 1977

Examiner's report to the Comptroller under Section 17 (The Search Report)

Application number
9211560.9

Relevant Technical fields

(i) UK Cl (Edition K) A3B

(ii) Int CL (Edition 5) A43B

Search Examiner
J GRAHAM

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search
6 JULY 1992

Documents considered relevant following a search in respect of claims 1-5, 7-11

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 591740 (THOMAS) - see page 3 lines 8-13 50-54 and 68-71	1,8,9
Y	US 4881329 (WILSON) - see Column 2 lines 58-65	5
X	US 4771554 (FOOT JOY) - see Column 1 lines 43-57	1,4,7,8
X	US 4592153 (JAURITO) - see eg Column 2 lines 53-57 and Column 5 lines 39-41	1,4,7,8,9
X	FR 2112848 (CONDERC) - see Figure 3	1,4,7
X	FR 2105684 (CONDERC) - see Figure 3	1,4,7,9

TP - doc99\fil000060

SF2(p)

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Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

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A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

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